AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

- 23. (Canceled)
- 24. (Canceled)
- 25. (Currently Amended) A method of performing a coarse frequency synchronization compensation for a carrier frequency deviation from an oscillator frequency in a demodulation system capable of demodulating a signal having a frame structure, said frame structure comprising at least one useful symbol and a reference symbol, said reference symbol being an amplitude-modulated bit sequence which comprises two identical sequences, said method comprising the steps of:

receiving said signal;

down-converting said received signal;

performing an amplitude-demodulation of the down-converted signal in order to generate an envelope, said envelope having two portions which are based on said identical sequences;

correlating one of said portions of said envelope with another one of said portions in order to determine said carrier frequency deviation; and controlling said oscillator frequency based on said carrier frequency deviation:

wherein said correlating step further comprises weighting of corresponding values of said two portions with corresponding values of said two sequences.

26. (Canceled)

27. (Currently Amended) The method of claim [[26]]25, wherein said carrier frequency deviation is determined as follows:

$$\Delta f = \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} \widetilde{r} \left(k + \frac{L}{2} \right) \cdot \widetilde{r}^*(k) \right) - \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} |\widetilde{r}(k)|^2 \right)$$

$$\Delta f = \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} \widetilde{r} \left(k + \frac{L}{2} \right) \cdot \widetilde{r}^* (k) \right)$$

wherein \tilde{r} designates values of said portions;

 \tilde{r}^* designates the complex conjugate of said values of said portions;

T_{MCM} designates the duration of said useful symbol;

k designates an index; and

- L designates the number of values of said two sequences of said reference symbol.
- 28. (Currently Amended) The method of claim 2625, wherein said carrier frequency deviation is determined as follows:

$$\Delta f = \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} \left[\widetilde{r} \left(k + \frac{L}{2} \right) \cdot \widetilde{r}^*(k) \right] \cdot \left[S_{AM}(k) S_{AM}^* \left(k + \frac{L}{2} \right) \right] \right)$$

Appl. No. 09/673,265

Amdt. Dated January 19, 2005

Reply to Office Action of August 19, 2004

wherein \tilde{r} designates values of said portions;

 \tilde{r}^* designates the complex conjugate of said values of said portions;

T_{MCM} designates the duration of said useful symbol;

k designates an index;

L designates the number of values of said two sequences of said reference symbol;

S_{AM} designates values of said identical sequences; and

 S_{AM}^* designates the complex conjugate of said values of said identical sequences.

- 29. (Currently Amended) The method according to claim <u>2325</u>, wherein said signal is an orthogonal frequency division multiplex signal.
- 30. (Currently Amended) The method according to claim 2325, further comprising the step of performing a fast automatic gain control of said received down-converted signal prior to the step of performing said amplitude-demodulation.
- 31. (Currently Amended) The method according to claim 2325, wherein the step of performing said amplitude-demodulation comprises the step of calculating an amplitude of said signal using the alpha_{max+} beta_{min-} method.
- 32. (Currently Amended) The method according to claim 2325, further comprising the steps of sampling respective amplitudes of said received down-converted signal and comparing said sampled amplitudes with a predetermined threshold in

order to generate a bit sequence in order to perform said amplitudedemodulation.

- 33. (Original) The method according to claim 32, wherein the step of sampling respective amplitudes of said received down-converted signal further comprises the step of performing an over-sampling of said received down-converted signal.
- 34. (Canceled)
- 35. (Canceled)
- 36. (Currently Amended) An apparatus for performing a coarse frequency synchronization compensation for a carrier frequency deviation from an oscillator frequency, for a demodulation system capable of demodulating a signal having a frame structure, said frame structure comprising at least one useful symbol and a reference symbol, said reference symbol being an amplitude-modulated bit sequence which comprises two identical sequences, said apparatus comprising:

receiving means for receiving said signal;

- a down-converter for down-converting said received signal;
- an amplitude-demodulator for performing an amplitude-demodulation of said down-converted signal in order to generate an envelope, said envelope having two portions which are based on said identical sequences;
- a correlator for correlating one of said portions of said envelope with another one of said portions in order to determine said carrier frequency deviation; and means for controlling said oscillator frequency based on said carrier frequency deviation:

wherein said correlator comprises means for weighting of corresponding values of said two portions with corresponding values of said two sequences.

Appl. No. 09/673,265 Amdt. Dated January 19, 2005 Reply to Office Action of August 19, 2004

37. (Canceled)

38. (Currently Amended) The apparatus of claim 3536, comprising means for determining said carrier frequency deviation as follows:

$$\Delta f = \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} \widetilde{r} \left(k + \frac{L}{2} \right) \cdot \widetilde{r}^*(k) \right) - \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} |\widetilde{r}(k)|^2 \right)$$

$$\Delta f = \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} \widetilde{r} \left(k + \frac{L}{2} \right) \cdot \widetilde{r}^* (k) \right)$$

wherein [[r]] $\underline{\tilde{r}}$ designates values of said portions;

 \tilde{r}^* designates the complex conjugate of said values of said portions;

T_{MCM} designates the duration of said useful symbol;

k designates an index; and

L designates the number of values of said two sequences of said reference symbol.

39. (Currently Amended) The apparatus of claim 3736, comprising means for determining said carrier frequency deviation as follows:

Appl. No. 09/673,265 Amdt. Dated January 19, 2005 Reply to Office Action of August 19, 2004

$$\Delta f = \frac{1}{2\pi \frac{L}{2} T_{MCM}} \arg \left(\sum_{k=1}^{\frac{L}{2}} \left[\widetilde{r} \left(k + \frac{L}{2} \right) \cdot \widetilde{r}^*(k) \right] \cdot \left[S_{AM}(k) S_{AM}^* \left(k + \frac{L}{2} \right) \right] \right)$$

wherein \tilde{r} designates values of said portions;

 \tilde{r}^* designates the complex conjugate of said values of said portions;

T_{MCM} designates the duration of said useful symbol;

k designates an index;

L designates the number of values of said two sequences of said reference symbol;

S_{AM} designates values of said identical sequences; and

 S_{AM}^* designates the complex conjugate of said values of said identical sequences.

- 40. (Currently Amended) The apparatus according to claim 3536, wherein said signal is an orthogonal frequency division multiplexed signal.
- 41. (Currently Amended) The apparatus according to claim 3536, further comprising means for performing a fast automatic gain control of said received down-converted signal preceding said amplitude-demodulator.
- 42. (Currently Amended) The apparatus according to claim 3536, wherein said amplitude-demodulator comprises means for calculating an amplitude of said signal using the alpha_{max+} beta_{min-} method.

Appl. No. 09/673,265 Amdt. Dated January 19, 2005 Reply to Office Action of August 19, 2004

- 43. (Currently Amended) The apparatus according to claim 3536, further comprising means for sampling respective amplitudes of said received down-converted signal, wherein said amplitude-demodulator comprises means for comparing said sampled amplitudes with a predetermined threshold in order to generate a bit sequence.
- 44. (Original) The apparatus according to claim 43, wherein said means for sampling comprises means for over-sampling said received down-converted signal.